CLAIMS

1. A vector for *in vivo* administration to a host, comprising:

a nucleotide sequence encoding an RSV F protein lacking an autologous RSV F signal peptide sequence and including a nucleotide sequence encoding a heterologous signal peptide which enhances the level of expression of RSV F protein in the host; and

a promoter sequence operatively coupled to the nucleotide sequence for expression of said RSV F protein in the host.

2. The vector of claim 1 wherein said nucleotide sequence encoding a heterologous signal peptide encodes Herpes Simplex Virus I (HSV I) gD.

3. The vector of claim 1 wherein said first nucleotide sequence encodes a RSV F protein fragment lacking a transmembrane coding region.

4. The vector of claim 1 wherein said promoter sequence is an immediate early cytomegalovirus promoter.

5. The vector of claim 1 further including a second nucleotide sequence to enhance the immunoprotective ability of said RSV F protein when expressed *in vivo* from said vector in a host.

6. The vector of claim 5 wherein said second nucleotide sequence comprises a pair of splice sites to prevent aberrant mRNA splicing.

7. The vector of claim 6 wherein said second nucleotide sequence is located between said first nucleotide sequence and said promoter sequence.

8. The vector of claim 7 wherein said second nucleotide sequence is that of rabbit β-globin intron II.

9. The vector of claim 1 which is a plasmid vector.

10. The vector of claim 1 which is plasmid p82M35B as shown in Figure 10.

11. An immunogenic composition for *in vivo* administration to a host for the generation in the host of a protective immune response to RSV F protein, comprising a vector as claimed in claim 1 and a pharmaceutically-acceptable carrier therefor.

12. A method of immunizing a host against disease caused by infection with respiratory syncytial virus (RSV), which comprises administering to said host an effective amount of an immunogenic composition of claim 11.

13. A method of using a nucleotide sequence encoding an RSV F protein lacking an autologous RSV F signal peptide sequence and including a heterologous signal peptide which enhances the level of expression of RSV F protein, which comprises:

isolating a gene encoding an RSV F protein having an autologous RSV F signal peptide sequence;

substituting a nucleotide sequence encoding a heterologous signal peptide which enhances the level of expression of RSV F protein for the nucleotide sequence encoding the autologous RSV F signal peptide sequence to form said nucleotide sequence;

operatively linking said nucleotide sequence to at least one control sequence to produce a vector, said control sequence directing expression of said RSV F protein when said vector is introduced into a host to produce an immune response to said RSV F protein; and

introducing said vector into the host.

14. The method of claim 13 wherein said nucleotide sequence encoding a heterologous signal peptide encodes Herpes Simplex Virus I (HSV I) gD.

15. The method of claim 13 wherein said nucleotide sequence encoding an RSV F protein encodes an RSV F protein lacking the transmembrane region.

16. The method of claim 15 wherein said at least one control sequence comprises the immediate early cytomegalovirus promoter.

17. The method of claim 16 including the step of:

operatively linking said nucloetide sequence to an immunoprotective enhancing sequence to produce an enhanced immunoprotection to said RSV F protein in said host.

18. The method of claim 17 wherein said immunoprotective enhancing sequence is introduced into said vector between said control sequence and said nucleotide sequence.

19. The method of claim 18 wherein said immunoprotection enhancing sequence comprises a pair of splice sites to prevent aberrant mRNA splicing.

20. The method of claim 19 wherein said immunoprotection enhancing sequence is that of rabbit β-globin intron II.

21. The method of claim 13 wherein said nucleotide sequence is contained within the plasmid vector p82M35B.

22. A method of producing a vaccine for protection of a host against disease caused by infection with respiratory syncytial virus (RSV), which comprises:

isolating a first nucleotide sequence encoding an RSV F protein having an autologous RSV F signal peptide sequence;

substituting a nucleotide sequence encoding a heterologous signal peptide which enhances the level of expression of RSV F protein for the nucleotide sequence encoding the autologous RSV F signal peptide sequence to form a second nucleotide sequence;

operatively linking said second nucleotide sequence to at least one control sequence to produce a non-replicating vector, the control sequence directing expression of said RSV F protein when introduced into a host to produce an immune response to said RSV F protein; and

formulating said vector as a vaccine for *in vivo* administration.

23. The method of claim 22 wherein said non-replicating vector is the plasmid vector p82M35B.

24. A vaccine produced by the method of claim 22.